PROXIMATE COMPOSITION AND MINERAL CONTENT OF THE AFRICAN SNAKEHEAD FISH *CHANNA OBSCURA*

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ABSTRACT

The proximate composition and mineral content of the African snakehead, *Channa obscura* from the Niger Delta, Nigeria was investigated with a view to provide nutritional data for dietary planning and baseline data for further research. Mean values for proximate composition were: pro ein 21.02%, fat 4.38%, moisture 67.82%, ash, 2.28%. The P, K, Na, Ca, Mg, Zn, and Fe contents of the fish samples was 3113.29mg/g, 237.35mg/100g, 332.12mg/100g, 383.25mg/100g, 455.33mg/100g 0.76mg/100g and 5.06mg/100g respectively.
Channa obscura thus constitutes a source of high protein is low in fat and is a rich source of P, Fe, K and Mg.

INTRODUCTION

Channa obscura are snakehead fish belonging to the Channidae family. They are indigenous to many tropical countries and are fresh water air breathing carnivorous fish. The African snakehead has long been recognized as an economically important fresh water fish with considerable potential for further contribution to aquatic food supplies (Timoulali et al, 1982, Micha, 1974, Victor and Akpocha 1992).

Snakeheads are popularly sold as live fish as well as dried fish and are considered a delicacy among the peoples of the Niger – Delta. In Asia, snakeheads are highly valued as food fish and according to Wee (1982) they attract high market price due to their firm white, practically boneless and highly flavoured flesh. Their flesh is claimed to be rejuvenating particularly during recuperation (Wee, 1982). Sharma and Simlot (1971) determined the approximate chemical composition of two popular snakehead species in Asia, this result and those for carp and tilapia showed that the snakeheads have a considerably higher protein and lower fat content than carp or tilapia. Zuraini et al (2005) studied the fatty acid and amino acid composition of three local Malaysian *Channa* species and reported that these snakeheads contained high levels of DHA which will explain their use for reduction of pain, inflammation and wound healing. The proximate composition of fresh and smoked *Tilapia, zilli*, *Channa obscura* and *Clarias gariepinus* from Akure Ondo State Nigeria was determined by Fapohunda et al (2006) and their results revealed that *Channa obscura* had a higher protein and lower fat content than *C. gariepinus*. This study did not take into account the mineral composition of this species and there appears to be a death in the accurate chemical composition of this valuable and highly underestimated fish species. This study was carried out with the objective of determining the proximate composition and mineral composition of *Channa obscura* from the Niger Delta with a view to providing nutritional data for dietary planning and providing basic data for further nutritional studies on *Channa obscura*.

MATERIALS AND METHODS

Five fresh adult snakehead fish (0.65g – 1kg) were purchased from a live fish market at Mile 1 market in Port – Harcourt. They were transported to be laboratory at ARAC, Aluu in plastic containers and stored in a deep freezer at – 20°c pending laboratory analysis.

ANALYSIS

The frozen fish samples were thawed, and gutted, washed, filleted, finely minced and homogenized for chemical analysis. Proximate chemical analysis of the fillet was carried out according to the official procedure of AOAC (1999).

Phosphorus was determined by spectrophotometric method (986.24) while Na, K, Ca, Mg, Zn, Fe were analysed by flame absorption spectroscopy method (985.35; AA 800 F). Triplicate determinants were carried out in each chemical analysis.

RESULTS

The results of the proximate composition of the samples of *Channa obscura* are shown in table 1. The species had mean protein content of 21.02%, Fat 4.38%, moisture 67.82% and ash 2.28%.

Table 1 Proximate Composition of *Channa obscura*

	Crude protein	Crude fat	Ash	Moisture
Mean value %	21.02	4.38	2.28	67.82
Std. deviation ±	0.44	2.02	0.36	3.13

The results of the mean mineral composition value is shown in table 2. The P, K, Na, Ca, Mg, Zn and Fe values were found to be 3113.29 mg/100g, 237.35mg/100g, 332.12mg/100g 383.25mg/100g, 455.33mg/100g, 0.76mg/100g and 5.06mg/100g respectively.

Table 2: Mineral Composition of *Channa obscura* (mg/100g)

	P	K	Na	Ca	Mg	Zn	Fe
Mean Value %	3113.29	237.35	332.12	383.25	455.33	0.76	5.06
Std. Deviation ±	10.79	40.72	10.5	69.80	47.06	0.04	1.13

DISCUSSION

This fish species belongs to the high protein (15-20%) category. (Stansby, 1982). The high tissue protein content may result from the equally high protein content of their diets being veracious piscivores. The concentration of the protein content was within the range reported for Asian snakeheads by Zuraini et al (2006) and 2% higher than that reported for fresh *C. obscura* from Ondo state by Faphohunda and Ogunkoya (2006).

The results of this study reveal that C. obscura has a higher protein content than adult samples of popular clarid fishes as reported by Effiong and Taga (2005) who recorded a protein content of 18.60%, 16.54% and 19.29% far *Clarias, Heterobranchus* and *Heteroclarias* specimens respectively. Osibona et al (2006). Ayinla (1993) and Fapohunda and Ogunkoya (2006) all recorded lower crude protein of *C. gariepinus* as compared to that of *C. obscura* in this study. *C. obscura* is thus a good source of high protein. Fishes with lipid content below 5% are considered lean (Stansby, 1982) and hence *C. obscura*. The lipid content falls with the range reported by Fapohunda and Ogunkoya but are at variance with those of Zuraini et al who recorded a range of 2.7 – 11.9% crude fat content for three Asian snakeheads. It is necessary to note that studies on the fatty acid composition carried out by Zuraini et al revealed that the Asian snakeheads contained

high levels DHA which explains the use of *Channa* species for muscle pain and inflammation. DHA has a specific role in neural cell membranes and is considered a desirable property in fish for human nutrition and health. It is not unlikely that similar results may be gotten with the African snakehead when investigated. Moisture content was within the range reported in other fishes by Gallagher et al (2001).

Fish muscle is regarded as a valuable source of Ca and P in particular but also of iron copper and selenium. Mineral concentrations in the *Channa obscura* samples were comparable to the values reported by Robinson et al for pond raised channel cat fish. The results of this study reveal that *Channa obscura* contained higher concentrations of calcium and phosphorus but equal concentrations of iron. Minimal levels of zinc were recorded as compared to channel cat fish. The values of Na, Ca, Mg for *channa obscura* are all higher than the average value (mg/100g) for mineral constituents of fish muscle as reported by Murray and Burt (1969). Higher values of Zn and Fe were reported for trout by Gokoglu et al 2004. The minimum recommended daily intake of Ca, Fe, Mg, P, and Zn are 1,200mg, 8mg, 360mg and 1,250mg respectively (supplement quality.com) thus reasonable amounts of this species can be consumed to provide this does. In conclusion based on the findings of this study, *Channa obscura* is highly nutritious – high in protein low in fat and good source of certain minerals.

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